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**Datasheet for the decision
of 3 August 2016**

Case Number: T 1419/14 - 3.2.01

Application Number: 03772990.2

Publication Number: 1581413

IPC: B60R21/207

Language of the proceedings: EN

Title of invention:

IMPROVEMENTS IN OR RELATING TO VEHICLE SEATS

Patent Proprietor:

Autoliv Development AB

Opponent:

TAKATA Aktiengesellschaft

Headword:

Relevant legal provisions:

EPC Art. 123(2), 54(1), 56

Keyword:

Amendments - allowable (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:



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Case Number: T 1419/14 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 3 August 2016

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted on
17 April 2014 concerning maintenance of the
European Patent No. 1581413 in amended form.

Composition of the Board:

Chairman G. Pricolo
Members: W. Marx
O. Loizou

Summary of Facts and Submissions

I. The appeal of the opponent is directed against the decision of the opposition division to maintain European patent No. 1 581 413 in amended form on the basis of the first auxiliary request filed during the oral proceedings.

II. In its decision the opposition division had no objections with regard to Article 123(2) EPC. Moreover, the subject-matter of claim 1 was considered to be new and inventive in view of the following documents:

D1: JP10-100764; and
D11: US 5 803 485.

III. Oral proceedings before the board took place on 3 August 2016.

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked in its entirety.

The respondent (patent proprietor) requested that the appeal be dismissed.

IV. Claim 1 of the respondent's sole request (i.e. claim 1 as maintained in amended form by the opposition division) reads as follows (amendments with respect to claim 1 as granted marked by strike-through for deletions and underlining for additions):

"A vehicle seat (1) comprising a squab (2) and a backrest (5), the backrest (5) comprising a frame (6) covered with upholstery (7), the frame (6) of the backrest (5) comprising a pair of spaced-apart metal beams

(10), each of which extends along a respective side region of the back-rest (5) so as to lie substantially parallel to the major axis (9) of the back-rest (5); and an air-bag unit (22) comprising an inflatable air-bag (28,29) connected to an inflator (23) to inflate the air-bag (28,29); the air-bag unit (22) being mounted to one of the beams (10) of the back-rest frame (6) so as to be located inboard of part of the frame (6) with the inflator (23) being positioned to direct gas into the air-bag (28,29) in a generally forward direction relative to the back-rest (5), characterised in that actuation of the air-bag unit (22) will cause the air-bag (28,29) to inflate so that at least part of the air-bag (28,29) lies between the frame (6) and an occupant of the seat; and wherein the air-bag unit (22) is mounted such that the inflator (23) is located adjacent the rear-most region of the ~~frame (6)~~ beam (10), so that a significant length of air-bag (28,29) bears against the ~~frame (6)~~ beam (10) as the air-bag (28,29) is inflated."

V. The appellant essentially argued as follows:

The additional features of two metal beams in amended claim 1 (taken from page 8 of the WO-application) related to a special embodiment shown in Figs. 2 to 5, which required an air-bag module having two air-bags, one of which arranged in the interior of the other one. With respect to the embodiment of Figure 6 showing a single air-bag, the inflator was mounted to the beam "in a manner generally identical to that described above" (page 14) and the air-bag was divided into a pair of chambers. Therefore, beams were only disclosed in connection with air-bags having two separate chambers. There was no general disclosure in the application as filed of any type of air-bag bearing

against a metal beam. Since the amended claim 1 was not restricted to any of these embodiments, the amendment constituted an unallowable generalisation and violated Article 123(2) EPC.

Amended claim 1 was not novel over D1. The opposition division's reasoning that the term "beam" only covered the D1's tubular frame part 13 and not the combination of the frame part 13 and the mounting member 26 could not be followed. The scope of the term "beam" hardly distinguished from the term "frame", which was construed by the opposition division to cover the integral combination of frame part 13 and mounting member 26. Even according to the definition of the term "beam" used by the opposition division (see section 2.4.5.4 of the decision), the combination of the left tubular frame part 13 and the mounting member 26 formed a longitudinal structural element having a modified cross section in the region of the mounting member and thus a "beam". Moreover, the mounting member 26 was welded to frame part 13, such that these two parts formed a single, integral and inseparable unit (see Figure 2 of D1) which was almost the same as a one-piece unit. However, a longitudinal structural element did not have to be formed by a single piece and did not require a constant cross section over its whole length.

As regards the features that the inflator was located "adjacent the rear-most region of the beam" and "a significant length" of the air-bag bearing against the beam, Figure 1 of the patent itself showed that the inflator 23 was located at a considerable distance from the rear end of the frame beam, even arranged entirely in the front half of the frame (and still being considered as *adjacent the rear-most region of the beam*), such that only a small portion (still being

considered as having a *significant* length) of the inflated airbag was bearing against the frame. Also Figure 2 of the patent showed the inflator at some distance to the rear end. In comparison, the D1's inflator, at least a rear region of the inflator, was not arranged in the forward half of the beam, but rather in the rear half of unit 13+26, and showed (see Figure 3) even a greater length of the airbag bearing against the beam. Moreover, claim 1 required the inflator to be arranged adjacent the rear-most region of the beam, i.e. adjacent a rear portion of the beam with a certain spatial extension, as formed e.g. by the rear half of tube 13, so the inflator 23 was "adjacent" to that rear region.

As regards the issue of inventive step, by locating the inflator adjacent the rear-most region of the beam so that a significant length of the inflating air-bag bore against the beam, the problem of improving the guiding function of the beam was solved. The solution of displacing the inflator known from D1 to a rear region of the beam was not inventive, and rather small values for the "significant length" were sufficient. Moreover, the skilled person would take from D11 the general idea of replacing the parts 13 and 26 by the beam 48 known from D11. Since the air-bag of D1 was already mounted on the inside of the beam, the skilled person would also adapt the shape of the beam of D11 so that the air-bag inflated properly.

Even if the term "beam" was construed as only covering D1's tubular frame part 13, amended claim 1 was not based on an inventive step. Providing a single piece frame arrangement for mounting the air-bag module solved the problem of how to simplify the mounting of the air-bag module to the vehicle seat. Starting from

D1, a skilled person would naturally consider forming the mounting element 26 and the left tubular frame part 13 as a single piece. Further, the skilled person might extract from D11 the general idea of mounting the air-bag module at an integrally formed, single-piece seat frame beam, which was compatible with D1's seat frame. In contrast to D1, which required that the seat frame was arranged in such a way that the air-bag inflated towards the vehicle's door side, the beam in D11 was directed along the longitudinal vehicle direction and the air-bag inflated towards the vehicle front. However, the skilled person would use D11's beam in line with D1's teaching, i.e. he would arrange the single-piece beam inclined outwardly corresponding to the mounting element that it replaced. Moreover, he would never consider arranging the air-bag on an exterior side of the frame as disclosed in D11, which would be against the main teaching of D1 that the air-bag unit was arranged on an interior side.

VI. The arguments of the respondent may be summarised as follows:

Four embodiments were described and depicted in the application, the second embodiment (Figure 6) being the only one for which a direct view of the metal beam was not provided. The arrangement of parallel metal beams forming part of the back-rest was a common feature applicable to all of the embodiments as shown in the application (see page 14).

Claim 1 was new with respect to D1, because D1 did not disclose that the air-bag unit was mounted to one of the beams, that the inflator was located adjacent the rear-most region of the beam, or that a significant

length of air-bag bore against the beam as the air-bag inflated. The term "beam" was significantly more technically limited than the more general term "frame". In particular, a beam was well understood as being a structural element resistant to bending, so the tubular element 13 of D1 was considered to be a "beam". The holding arrangement or bracket 26 holding the inflator was added afterwards and did not perform such function. Moreover, the definition in claim 1 of a rear-most region was of technical significance as expressed by the following feature ("so that ..."). In D1, the back half of the "beam" as understood by the appellant did not assist in guiding the air-bag. Figure 1 of the patent only showed a schematic side view, so in case of any contradiction to the cross sectional view according to Figure 2, Figure 2 took precedence over Figure 1.

The prior art cited in the patent specification related to air-bags inflating outwardly towards the vehicle side door, as known from D1 or D11. As no new prior art was provided, the invention still addressed the problem stated in the patent, i.e. of improving the protection of an occupant of the seat in the event of a side impact. The solution as claimed ensured that the inflating air-bag was directed inwardly and pushed the occupant inwardly towards the centre line of the vehicle, thereby increasing the distance between the occupant and the side of the vehicle. In contrast, the air-bag of D1 pointed outwardly towards the vehicle door. If the skilled person, starting from D1 and attempting to solve the objective technical problem, turned to D11, he would find no disclosure of any features which would be likely to increase the protection afforded to the seat occupant. In D11, the air-bag was mounted on the exterior side of the frame and inflated forwardly and outwardly (see arrow in

Figure 5), in a manner similar to that of D1, so there was no motivation to change anything. Even if the skilled person were to incorporate the teaching of D11 into D1, he would simply transfer the beam and associated air-bag mounting from D11 to D1. Thus, the mounting of the air-bag on the exterior of the beam was maintained, since mounting on the inside of the hook-shaped beam would be contrary to the teaching of D11. Both documents D1 and D11 showed that the air-bag inflated in a direction which was inclined outwardly away from the forward direction. Therefore, in the absence of any relevant hint or teaching, the skilled person would not combine the teachings of D1 and D11 to result in an arrangement in which the air-bag was provided in such a way (on the inside of the beam of D11) that it would inflate in a forward and inward direction. The skilled person would certainly not consider changing the angle at which the beams of D11 were set, because the beams in D11 were aligned specifically to be resistant to the forces arising from a front collision.

Reasons for the Decision

1. *Amendments (Article 123(2) EPC)*
 - 1.1 Claim 1 as maintained in amended form in opposition proceedings has not been amended in such a way as to contain subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).
 - 1.2 The feature added in the preamble of claim 1 ("the frame (6) of the backrest (5) comprising a pair of spaced-apart metal beams (10), each of which extends

along a respective side region of the back-rest (5) so as to lie substantially parallel to the major axis (9) of the back-rest (5)") is disclosed literally in the original WO-application on page 8, lines 6 to 10. This was not contested by the appellant.

Moreover, the characterising portion of claim 1 now specifies mounting of the air-bag in relation to one of the beams instead of specifying mounting in relation to the back-rest frame. This, also, was not in dispute.

1.3 The board finds that the subject-matter of claim 1 is in accordance with all the embodiments described in the specification, even if no metal beams are shown in the only figure (Figure 6) which relates to the second embodiment. As can be concluded from the passage cited by the appellant himself, relating to the second embodiment according to Figure 6 (see page 14, lines 3 to 5, of the application as filed: "The single air-bag 40 is again connected to the inflator 23, which is mounted to the beam 10 of the back-rest frame in a manner generally identical to that described above."), metal beams must be implicitly assumed also for this embodiment. Therefore, the content of the technical information provided by the documents forming the basis for maintaining the patent in amended form (i.e. claims, description, drawings) has not changed compared to the application documents as filed, as might be the case when, in view of an amended claim, a specific embodiment has to be given a meaning which was not originally disclosed.

1.4 The appellant argued that the amendment amounted to an unallowable generalisation, because beams were only disclosed in connection with air-bags at least having a pair of chambers, i.e. there was no general disclosure

in the application as filed of any type of air-bag bearing against a metal beam.

In the case law of the Boards of Appeal, an amendment of that kind, where features are extracted from a set of features which were originally disclosed in combination for preferred embodiments, is often referred to as "intermediate generalisation". However, such kind of amendment is not *per se* unallowable. According to the established case law, it is justified in the absence of any clearly recognisable functional or structural relationship among these features of the specific combination, i.e. if the extracted feature is not inextricably linked with those features.

In the present case, the board cannot see, and it had not been demonstrated by the appellant, that the feature "pair of spaced-apart metal beams" specifying the supporting structure of the frame of the back-rest is inextricably linked to the type of air-bag used.

2. *Novelty (Article 54(1) EPC)*

2.1 The subject-matter of claim 1 is new over the disclosure of document D1 (Article 54(1) EPC).

2.2 The appellant objected to the opposition division's reasoning that the term "beam" (also in view of the definition of this term as proposed by the opposition division) only covered the D1's tubular frame part 13 and not the combination of the frame part 13 and the mounting member 26. In particular, a single unit of non-constant cross section was formed by welding mounting member 26 to frame part 13, which allegedly

represented a longitudinal structural element or "beam" as specified in claim 1.

2.3 Following the appellant in that the longitudinal structural element as known from D1, consisting of a tubular beam and a bracket joined by welding, taken as a whole would fall under the definition of a "beam", the board still sees further distinguishing features over D1, in particular that

"the air-bag unit (22) is mounted such that the inflator (23) is located adjacent the rear-most region of the beam (10), so that a significant length of air-bag (28,29) bears against the beam (10) as the air-bag (28,29) is inflated".

2.3.1 The appellant argued that part of the D1's inflator was arranged in the rear half region of the beam. However, according to Figure 4 of D1, the inflator 23 is located in the forward half, or at best in a middle region of a "beam" composed of the frame part 13 and the mounting member 26, but certainly not in a rear-most region of the beam as required by claim 1.

Although the schematic side view according to Figure 1 of the contested patent seems to indicate, by way of reference sign 23, an inflator located in the forward half region of the back-rest frame 7, Figure 1 fails to disclose a beam which is marked with reference sign 10 in Figure 2 onwards. For this reason alone, Figure 1 does not provide a clear teaching of how the inflator is positioned in relation to the beam, so an interpretation of the term "adjacent the rear-most region of the beam" deviating from its normal meaning, which would also be at odds with the representation given in the detailed sectional view according to Figure 2 (and also further Figures 3 to 5, 7, 8),

cannot be assigned to this term on the basis of Figure 1 of the patent specification, as alleged by the appellant. Since the term "adjacent the rear-most region of the beam" specifies a rear portion of the beam with a certain spatial extension, as acknowledged by the appellant, claim 1 comprises embodiments in which the inflator is located at some distance to the rear end of the beam, so no contradiction in view of Figure 2 of the patent specification is observed.

- 2.3.2 Moreover, the "beam" of D1 does not provide the function as specified in claim 1, namely that "a significant length of the air-bag bears against the beam as the air-bag is inflated". The board finds that, in the context of the teaching of the contested patent, this functional feature requires some load supporting and guiding structure to be provided on the beam in order to support and guide the air-bag during inflation. As explicitly described in the patent specification (see paragraph [0051] which describes how the invention works; also paragraphs [0003], [0004], stating disadvantages of the known prior art), by bearing against the inner surface of the beam, the inflating air-bag is prevented from moving outboard in this region, which ensures that the inflating air-bag is located sufficiently close to the occupant. D1 might show an air-bag bearing against a bracket, but without further details given in D1 on e.g. the size of the bracket, the load supporting and guiding feature during air-bag inflation as required by claim 1 is not directly and unambiguously derivable from D1.

3. *Inventive step (Article 56 EPC)*

- 3.1 The board finds that the subject-matter of claim 1 also involves an inventive step (Article 56 EPC).

3.2 The distinguishing features over D1 as identified above (see point 2.3) provide a supporting and guiding function for the air-bag during inflation, the effect of which is that the inflating air-bag is located sufficiently close to the occupant during the early stages of deployment. Starting from D1 as the closest prior art, the skilled person was therefore confronted with the objective technical problem of improving the protection of an occupant of the seat in the event of a side impact. The board does not follow the appellant's formulation of the problem to be solved (i.e. improving the guiding function, or simplifying the mounting of the air-bag module), since the technical problem must be formulated so as not to contain any pointer to the solution.

3.3 In view of document D1 alone, the board cannot see that the skilled person would contemplate displacing the inflator to a rear region of the beam or modifying the mounting member in order to solve the problem posed.

When displacing the inflator more rearwardly on the existing bracket, the air-bag would inflate more in the back of the seat occupant than to his side, which does not contribute to an improved protection during a side impact. As regards the mounting member, due to the restriction space available in the side bolster, there is not much room for modifying its shape. According to the teaching of D1, the air-bag should inflate outwardly towards the vehicle side, and thus an angled shape of the bracket saves space in the lateral direction of the vehicle seat and would therefore not be abandoned. Shortening the rear part of the bracket in D1 might bring the inflator closer to the rear-most region of the "beam" consisting of tubular frame 13 and

mounting member 26, but would at the same time increase the distance of the air-bag from the occupant and therefore also provide a detrimental effect.

- 3.4 As regards the teaching of document D11, the board has already difficulties in understanding why the mounting arrangement of the air-bag in D11 should provide an improved protection to the seat occupant in comparison to D1. Both the air-bag in D1 (due to the outwardly inclined positioning of the air-bag) and in D11 (see arrow in Figure 5) are inflated in a similar manner outwardly towards the vehicle's side door. In view of the problem as stated above, the board is already of the opinion that the skilled person starting from D1 would not be prompted by D11 to modify the mounting arrangement of the air-bag as known from D1.

Even following the appellant's argument that the skilled person would take from D11 the general idea of having a one-piece beam (replacing the frame part 13 and the mounting member 26 of D1), the skilled person would only arrive at an air-bag mounted on the exterior of the beam as disclosed in D11. The board cannot see any reason for changing this mounting position by mounting the air-bag inboard of the beam. This would modify the general concept as taught in D1 and D11 of inflating the air-bag towards the vehicle side door. Moreover, it would require further modifications to the beam's shape, so that inflation of the air-bag is not compromised, which is therefore not considered obvious.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated